Freight Transportation Planning in Oregon

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Passage of the federal Intermodal Surface Transportation Efficiency Act (ISTEA) in 1991 and the Transportation Equity Act for the 21st Century (TEA 21) in 1998 has resulted in a higher visibility for freight at the federal, state, and regional levels. Numerous governmental jurisdictions across the U.S. now are emphasizing freight and or goods movement more than in the past.

This paper highlights freight transportation planning in Oregon, especially at the Oregon Department of Transportation (ODOT). The paper covers the following topics:

- a selective review of recent federal and state-level efforts,
- a overview of freight transportation planning, policy, and programming in Oregon,
- a summary of Oregon's 1999 freight study,
- comments on private industry involvement in Oregon's transportation improvements, and
- identification of freight-related performance measures and their usage in Oregon.

The paper concludes with comments about the successes, challenges, and status of freight transportation planning at ODOT.

Overview

Federal. To support freight movements, ISTEA included a variety of planning provisions. Metropolitan Planning Organizations (MPOs), for example, were required to conduct transportation planning activities, including the development of plans that address the efficient movement of freight and access to ports, airports, and intermodal transportation facilities. Similarly, states were required to develop multimodal transportation plans that considered efficient freight movements and access to intermodal facilities. Another important requirement was for states to develop six information management systems, including an Intermodal Management System (IMS) for freight and passenger movements through intermodal facilities.

Other federal freight-related activities include the passage of legislation to implement provisions in ISTEA as well as the development of a national freight transportation policy. Passage of the National Highway Designation System Act of 1995, for example, identified the routes to be included on the National Highway System (NHS), including routes to major intermodal freight facilities. The NHS legislation also removed the ISTEA requirement for states to develop the IMS and four of the other five management systems.

In early 1997, the U.S. Department of Transportation issued a National Freight Transportation Policy Statement to help shape decisions affecting freight transportation across the various modes. In general, the policy's guiding principles address funding and planning, cost-effective investments, economic growth, safety, environmental protection, energy conservation, technological advances, defense and emergency requirements, international trade, and freight and passenger service on joint facilities.

With the signing into law of TEA 21 in June 1998, federal transportation funding provisions were reauthorized until the year 2003. TEA 21 retains many of the same or similar provisions initially established in ISTEA, including requirements for state and metropolitan transportation planning. While reducing the complexity of requirements for multimodal transportation planning, TEA 21 retains provisions requiring states and MPOs to address freight mobility, access, and connectivity. TEA 21 also requires freight shippers and other stakeholders to be given opportunities to comment on transportation plans and TIPs.

State. In the last five or so years, an increasing number of state transportation agencies have intensified freight policy, planning, and programming activities. Table 1 summarizes selected plans and studies detailing aspects of how several states have addressed or are currently addressing freight transportation or goods movement. Additionally, numerous states have a rail freight plan or similar document, as well as corridor studies addressing freight or goods movement. Further information about activities in several of these states is highlighted on the program for the National Freight Transportation Workshop, September 12-14, 2000, in St. Paul, Minnesota.

Oregon Freight Policy and Planning

State. The Oregon Department of Transportation began explicitly incorporating freight considerations into its transportation policy and planning activities prior to and consistent with ISTEA requirements. This occurred in part due to the recognition that freight mobility is a key component of Oregon's economic livelihood.

The *Oregon Transportation Plan* (OTP), adopted by the Oregon Transportation Commission (OTC) in 1992, is ODOT's first multimodal transportation plan. The OTP recognizes the importance of freight to the state's economy through a number of policies and actions under an overall economic development goal. In general, the policies support accessibility, connectivity/linkages, safety, mobility, balance, and capacity as part of a multimodal and intermodal transportation system.

OTP Freight Policy Categories

- Accessibility
- Connectivity among places
- Connectivity among modes and carriers
- Safety
- Rural mobility
- Balanced and efficient freight system
- Linkages to markets
- Expanding system capacity
- Intermodal hubs
- Management practices

Table 1

Examples of Statewide Freight Plans or Studies

California	California Department of Transportation, *Statewide Goods Movement Strategy* (1998) http://www.dot.ca.gov/hq/tpp/Offices/OSP/FnlStrat.htm
Delaware	Delaware Department of Transportation, *Statewide Freight and Goods Movement Plan*
Florida	Florida Chamber of Commerce Foundation, *Transportation Cornerstone Florida* (1999) http://www.flchamber.com/foundation/transportation_cornerstone.htm Florida Department of Transportation, *Year 2020 Florida Statewide Intermodal System Plan* http://www.dot.state.fl.us/intermodal/intermod.pdf
Louisiana	Louisiana Transportation Research Center, *Access to Louisiana Freight Terminals: An Intermodal Transportation Planning Framework for Needs Assessment and Funding* http://www.ltrc.lsu.edu/pdf/projcap00_3ss.pdf
Maine	Maine Department of Transportation, *Maine Integrated Freight Plan* (1998)
Maryland	Maryland Department of Transportation, *State Freight Infrastructure Study*
Minnesota	Hubert Humphrey Institute of Public Affairs (University of Minnesota), *Minnesota Freight Flows* (1990) Minnesota Department of Transportation, *Minnesota Statewide Freight Flows Study* (2000) http://www.dot.state.mn.us/ofrw/FreightFlowReport/Executive%20Summary.pdf
Nevada	Nevada Department of Transportation, *Nevada Statewide Intermodal Goods Movement Study* (2000)
Oregon	Oregon Department of Transportation, *Freight Moves the Oregon Economy* (1999) http://www.odot.state.or.us/intermodal-freight/Reports/Freight%20Moves/freight%20moves%20contents.htm
Pennsylvania	Pennsylvania State Transportation Advisory Committee, *Freight Movement in the Commonwealth* (1999)
Virginia	Virginia Transportation Research Council, *A Methodology for Statewide Freight Transportation Planning* (1998) Virginia Transportation Research Council, *Statewide Intermodal Freight Planning Methodology: Application and Validation* Virginia Department of Transportation, *Intermodal Transfer Facility Study*
Washington	Washington State Legislative Transportation Committee, *Freight Mobility Advisory Committee Findings and Recommendations* (1997) Freight Mobility Strategic Investment Board, *Activities and Recommendations Report* (1999) http://www.fmsib.wa.gov/Report/FMSIB1999Report.pdf
Wisconsin	Wisconsin Department of Transportation, *Transportation Alternatives for Economic Development in Wisconsin* (1994) http://www.bts.gov/smart/cat/ted.html

Source: State DOT web sites and personal communications.

For each policy in the OTP, there are one or more implementing actions. These refer to activities that ODOT can undertake over a 20-year time period in coordination with other state and federal agencies, local jurisdictions, and the private sector.

A number of other planning and related efforts complement and support the OTP in addressing freight mobility (Figure 1). Modal and related plans and studies address freight by updating and expanding freight provisions in the OTP. Like the OTP, modal plans cover a 20-year time period and are revised and updated every five to seven years depending on resources available and other considerations.

Among the modal and related plans and studies, the *Oregon Rail Freight Plan* is the most explicit in its focus on freight. Oregon's first rail plan was completed in 1978 and has been updated four times, most recently in 1994. Earlier versions of the rail plan were prepared mostly to meet Federal Railroad Administration requirements for receiving funding through the Local Rail Freight Assistance program.

The 1994 Rail Freight Plan expanded earlier rail plans and the OTP by including specific policies and actions pertaining to economic competitiveness of the rail system, retention of local rail service, protection of abandoned rights-of-way, and integration of rail freight considerations into land use planning efforts. The plan also makes a number of funding recommendations to support rail freight needs, primarily rail infrastructure and equipment. ODOT currently is updating the Rail Freight Plan, with an expected completion date later this calendar year.

Rail Freight Plan
Policy Categories
- Economic competitiveness
- Protection of abandoned rights-of-way
- Retention of rail service
- Integration into local land use planning

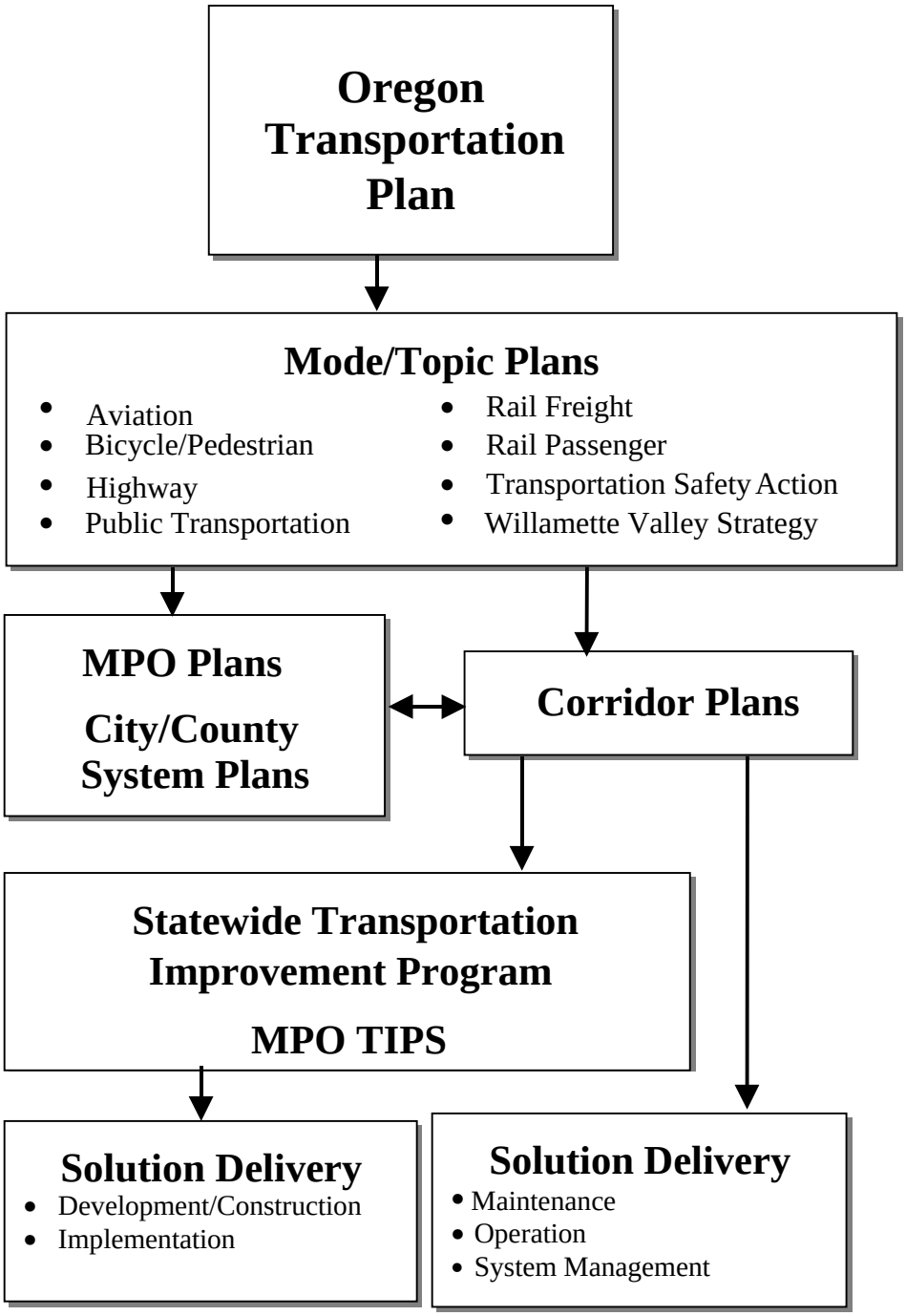
The *Oregon Highway Plan*, adopted by the OTC in March 1999, is the other major modal plan addressing freight. Among the Highway Plan's provisions is the designation of a State Highway Freight System. The plan also identifies several freight-related performance measures as well as a number of policies and actions relating to the freight system and efficiency of freight movements. Included as one of the plan's actions is the preparation of a statewide freight study.

Other freight-related provisions in the Highway Plan include policies and actions relating to access from highways to adjacent properties. The Highway Plan's access management policies are intended to balance access to developed properties while ensuring the safe and efficient movement of through traffic and local traffic. The plan identifies a range of policies, actions, and standards pertaining to interchange development, driveway and roadway spacing and design, traffic signal location, median design and spacing of openings, and

Highway Plan
Freight Policy Categories
- State highway freight system
- Efficiency of freight movements

Figure 1

Oregon Transportation Planning and Programming



other factors associated with managing access along various types of urban and rural highways. Managing access includes providing for through truck movements as well as for the pick up and delivery of goods and materials to and from adjacent commercial properties such as those in urban business areas.

The *Oregon Transportation Safety Action Plan* and the *Willamette Valley Strategy*, both adopted by the OTC in 1995, address freight but in less detail than the rail freight and highway plans. The Safety Plan includes several policies for truck, rail, and marine safety, while the *Willamette Valley Strategy* includes a number of recommended strategies to improve freight connections, safety, and mobility on Willamette Valley intermodal facilities and highways, rail lines, and waterways.

The *Oregon Aviation Plan*, adopted by the OTC in March 2000, is the most recent modal plan. The Aviation Plan addresses airport infrastructure conditions and needs, and contains a variety of policies and actions similar to those in the other modal plans discussed above.

ODOT also is working with a variety of public and private sector interests to develop multimodal plans for 31 transportation corridors statewide. Corridor planning focuses on the development of corridor strategies and corridor plans listing projects and programs for a 20-year time period. Projects and programs in corridor strategies and plans include those to enhance freight mobility and connectivity.

In cooperation with the Washington Department of Transportation and regional jurisdictions in the Portland-Vancouver (WA) area, ODOT is participating in an Interstate Highway 5 (I-5) Trade Corridor project. The purposes of the project are to analyze existing and future transportation conditions in the corridor, identify the role of I-5 in the regional economy, develop a range of possible solutions for improving freight mobility in the corridor, and identify specific alternatives for solving the corridor's transportation problems. A portion of the project's funding is from TEA 21's National Corridor Planning and Development Program.

Regional and Local. Federal laws require transportation plans for metropolitan areas. Metropolitan Planning Organizations have been designated in four of Oregon's five metropolitan areas. In the last couple years, the four MPOs have completed draft or final regional transportation system plans in which freight concerns and needs are addressed.

The Oregon Transportation Planning Rule (Oregon Administrative Rule 660-012) requires cities and counties to prepare Transportation System Plans (TSPs) to help implement Oregon's statewide planning goal for transportation (Goal 12). Among the various components of TSPs are lists of projects and programs to meet anticipated local transportation needs over a 20-year period. Although the Planning Rule requires local jurisdictions to develop plans incorporating elements for various freight-moving modes, it does not require them to specifically identify projects and programs to enhance freight mobility.

Oregon Transportation Programming

Local, regional, and statewide capital improvement programs (CIPs) and transportation improvement programs (TIPs) identify specific projects and programs for funding. Federal law requires projects included in MPO TIPs to also be included in the Statewide TIP. ODOT and other jurisdictions are currently in varying phases of developing improvement programs for the years 2002-2005.

When completed, TSPs and corridor plans are intended to be the source of projects included in improvement programs. Because few TSPs and corridor plans have been completed and adopted by governing bodies, they have not been the primary sources of projects in improvement programs. A variety of other procedures have been used, including identification based on modeling procedures, analysis of technical data, and input from public involvement efforts held across the state.

Other projects are developed independently of the STIP process. For example, port districts and other local jurisdictions may develop projects with their own sources of financing. These projects may or may not be identified in the state, regional, or local improvement programs. Small or routine projects may not be of sufficient size or perceived importance to be identified in improvement programs.

For the 2002-2005 STIP, the ODOT Planning Section is developing a series of maps and other information to help regional STIP coordinators and others understand where improvements to facilitate goods movement may be needed. The overall intent is to help identify projects that would enhance freight mobility and Oregon's economy. Another objective is to move forward on implementing an action in the 1999 *Oregon Highway Plan* calling for a STIP process to systematically improve highway segments that hinder or prevent freight movements.

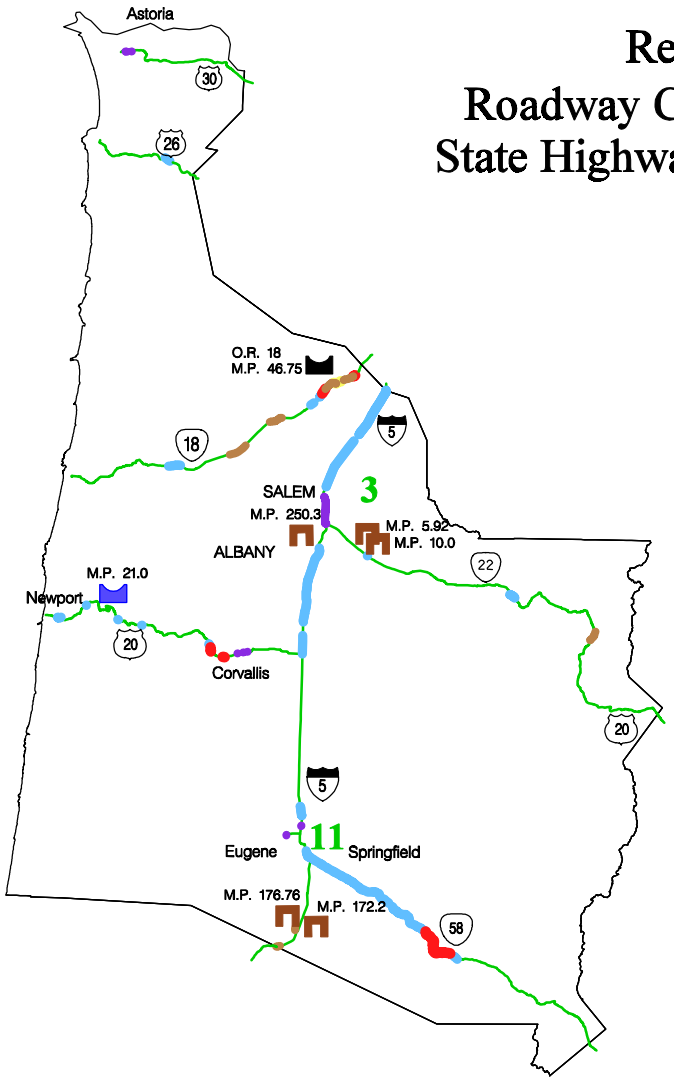
The maps show information about segments of Oregon's highways that

- are congested,
- have been designated as truck crash corridors, or
- have poor or very poor pavement conditions, weight-restricted bridges, low-clearance bridges, or length-restrictions for tractor semitrailer combinations.

Maps show data for highways on the State Highway Freight System separately from highways that are not on the freight system. Statewide maps are similar to those in the Oregon freight study described below. Maps also have been developed for each of ODOT's five regions statewide, as well as for areas as the sub-regional level as designated for eight Area Commissions on Transportation. Figure 2 illustrates one such map.

Figure 2

Region 2
Roadway Concerns on the State Highway Freight System



Truck Crash Corridors

3	I-5 Salem Area M.P. 252-260
11	I-5, OR126, OR 58 and US 101 in Lane County

N

0 10 20 30 MILES

- Freight System Route
- Urban Congestion
- Rural Congestion
- Rural Congestion and Poor Pavement Conditions
- Urban Congestion and Poor Pavement Conditions
- Poor Pavement Conditions
- Low Clearance Structures 14' to 14' 6"
- Weight Restricted Bridges
- Structurally Deficient Bridges

Source: See maps earlier in this report

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Oregon Freight Study

In July 1999, the Oregon Department of Transportation's Planning Section completed *Freight Moves the Oregon Economy*, a document which reviews and summarizes

- freight's importance to Oregon's economy,
- freight policies and actions in statewide multimodal and modal plans,
- location of major freight corridors, intermodal facilities, and other freight facilities,
- commodity movements,
- freight concerns and needs, and
- next steps for freight planning, policy, and research activities.

The freight study supports various ODOT transportation planning efforts by pulling together a variety of existing freight-related information into a single document. Although it is not a plan or policy document *per se*, it is becoming a valuable resource to ODOT policy makers, planners, and programmers as well as to transportation planners in other jurisdictions and consultants working on Oregon transportation planning products.

Freight's economic importance. The study uses national and state-level data to provide a picture of freight's importance in Oregon. Depending on type of measure used, freight transportation is estimated to account for between 5 and 15 percent of Oregon's economy. Economic impact models and studies suggest that for each 100 jobs in freight-related sectors of Oregon's economy, 85 to 150 additional jobs are generated through multiplier effects in other sectors of the economy.

Freight Planning. This covers the various multimodal and modal planning efforts underway at the state and regional levels. An appendix itemizes the various freight-related goals, policies, and actions from the plans.

Freight Transportation System. Text and maps provide readers with locational information about goods movement corridors, volumes, intermodal facilities, distribution centers, truck terminals, and other freight generators such as manufacturing plants. Maps show leading counties in the production of various resource-based freight such as agricultural commodities, timber, minerals, and fisheries products. A summary of commodity movements based on federal, state, and Port of Portland sources provides additional information on current and forecast freight volumes.

Concerns and Needs. This section summarizes previous efforts to obtain information from stakeholders about concerns and needs, and reviews performance measures identified for the Intermodal Management System (IMS), *Oregon Highway Plan*, and ODOT Motor Carrier Transportation Division. The study does not identify specific freight improvement projects except those that have been identified in other plans or studies.

For *highways*, the freight study focuses on performance data for congestion, bridge and pavement conditions, and geometrics as identified through truck length restrictions.

For local streets and roads, the freight study presents information for only the largest jurisdictions (as represented by Metropolitan Planning Organizations) and for jurisdictions with local streets and roads between highways and airports, intermodal rail yards, marine terminals, and other major intermodal facilities. The definition of a major facility is based on Federal Highway Administration (FHWA) criteria for National Highway System intermodal connectors.

Due to the difficulty of developing information and/or the absence of data, the study's assessment of concerns and needs for the other modes is more general than for highways. *Rail* needs were based on information from ODOT's Rail Division and several port districts. Concerns and needs include:

- improving the physical condition of rail trackage,
- purchasing specialty rail cars,
- increasing tunnel clearance in mountainous areas,
- repairing rail bridges,
- reducing conflicts with motor vehicles at rail crossings, and
- upgrading or repairing inadequate trackage near intermodal terminals.

Concerns and needs for *marine* facilities focus mostly on deepening the Columbia River from 40 to 43 feet below Portland to accommodate deeper draft ocean-going ships, and maintaining shallow-draft barge navigation on the Columbia above Portland. Other concerns include the need to maintain funding for dredging of shallow draft ports along the Oregon Coast, and addressing environmental issues associated with hazardous materials at the bottom of the Willamette River near Portland-area marine terminals.

For *air* cargo transportation, the study reports information from ODOT's Continuous Aviation System Plan and from airport master plans. Concerns include the need to expand facilities such as runways and terminals, primarily for passenger traffic, and to better separate passenger and freight traffic. As with marine terminals, the study addresses landside needs for airports in its discussion of highways and local connector roads.

Pipeline concerns include the need to expand capacity as population and economic activity grow. The study identifies locations that do not have natural gas service, and develops a rough estimate of costs for laying a pipeline to one of these areas.

Next Steps. The study's "next steps" chapter identifies opportunities to refine and implement existing transportation policies and plans, fill gaps in information, further identify freight transportation needs and concerns, and address selected other topics (Table 2).

Private Sector Involvement

The private sector has a variety of opportunities to provide input into decision making for freight transportation improvements. Most ODOT corridor plans and local and regional

Table 2

Freight Study: Next Steps

Next Step Category	Next Step
Policy and Planning	• Consider developing a comprehensive statewide freight policy • Continue working to address air freight issues in the Aviation Plan • Assist in implementing policies and actions in the Highway Plan • Update ODOT's rail freight and passenger plans • Explore the need to develop a marine freight plan • Continue to assist ODOT regions, MPOs, and others with freight planning
Information Gaps	• Install additional Automatic Traffic Records to monitor truck volumes • Develop better commodity flow information statewide • Further develop information on freight's importance to the Oregon economy • Work with the ODOT Research Group and others to identify freight research topics • Consider conducting a carrier-shipper survey
Needs Identification	• Continue monitoring Columbia River deepening and drawdown issues • Continue developing the Intermodal Management System • Set up Statewide Transportation Improvement Program process to improve highways with freight impediments
Other	• Prepare a study on freight funding sources • Continue to identify and develop ITS applications for freight movements • Develop user friendly information about freight transportation

transportation system plans have advisory committees that identify transportation improvements needed over a 20-year time period. Private-sector representatives from freight-related businesses often are invited to serve on these committees.

Similarly, ODOT has to date established eight Area Commissions on Transportation (ACTs), whose purpose is to advise the Oregon Transportation Commission much as city or county planning commissioners serve their jurisdictions. This includes identifying and prioritizing transportation improvements needed within a two- or three-county area. ACTs are composed of local transportation representatives, elected officials, and business representatives of the counties within each ACT's boundaries.

ODOT and other jurisdictions also have sought private sector input through several efforts specifically directed to identifying needed freight or intermodal transportation improvements (Lawson and Riis 2000). These include:

- *Results of the Port Shipper Survey*, Port of Portland, 1995
- *Southwest Oregon Freight Movement Study*, ODOT, 1995
- Intermodal Management System interviews, Metro, ODOT, and the Port of Portland, 1997
- Freight logistics interviews, Metro and the Port of Portland, 1998, and
- *Freight Users/Shippers Logistics Interviews: Interstate 5 Corridor*, ODOT, 1999

Each of these involved telephone and on-site interviews of shippers, carriers, port representatives, and other persons regarding their perceptions on where improvements were needed for moving freight. The number of persons interviewed for the studies ranged from 11 to 72.

Another more extensive effort is currently underway to obtain input from a larger number of users of the freight transportation system. Sponsored through ODOT's research office and managed through the Transportation Research Group at Portland State University, the freight shipper and motor carrier survey began in 1999 and is expected to be completed by June 30, 2001. One purpose of the survey is to uncover patterns in concerns about freight bottlenecks or other issues from a much larger group of system users than has been the case in previous surveys.

The Oregon Freight Advisory Committee, established by ODOT Director Grace Crunican in August 1998, is another group providing input to ODOT on freight transportation issues. The committee began in part because of selected stakeholders' desires to give freight more visibility in ODOT policy, planning, and programming. Initially, the committee served in an advisory role to ODOT. As the committee continues to evolve, it is expanding its interests beyond those directly influenced by the state transportation agency. Their activities have included writing letters

- supporting the Columbia River deepening project below Portland,
- supporting a bi-state I-5 trade corridor project,
- identifying *Oregon Highway Plan* issues and concerns,
- requesting more information about the economic impacts in Oregon from a proposed natural gas pipeline in Washington, and
- requesting better documentation of freight transportation impacts in Oregon potentially resulting from the breaching of four dams on the lower Snake River.

Other topics discussed at committee meetings have included:

- TEA 21 freight funding opportunities,
- *Freight Moves the Oregon Economy* study,
- Columbia-Snake River System issues on barging and dam drawdowns or breachings,
- FHWA intermodal connectors condition and investment study,

- reauthorization of the Surface Transportation Board,
- Legislative funding, and
- Transportation Improvement Program development.

The committee meets about 10 times annually and consists of approximately 25 members representing shippers, carriers, port districts, economic development groups, and others. Its first chair was the transportation manager for a forest products company. The current chair is an executive officer for a land management and development company.

Performance Measures

The federal interim rule for implementing ISTEA management systems required states to identify parameters "that are suitable to measure and evaluate the efficiency of intermodal facilities and systems in moving people and goods from origin to destination" (*Federal Register* 1993). The Federal Highway Administration subsequently issued technical guidelines suggesting categories of intermodal performance measures, including (Ismart 1993):

- physical limitations to intermodal movement,
- accessibility to intermodal facilities,
- transferability and coordination between modes,
- legal and regulatory constraints to intermodal transportation
- delivery and connection systems for intermodal facilities
- safety of intermodal facilities and systems, and
- economic and environmental tradeoffs between modes.

FHWA guidance was supplemented later by various documents, including a guidebook on setting intermodal performance standards (Norris 1994) and a summary of what various state transportation agencies were doing to establish intermodal performance measures (Czerniak et al. 1996). More recent FHWA-sponsored guidance recommended seven performance indicators to further develop as measures of productivity and efficiency in the movement of goods by motor vehicles (Hagler Bailly Services 2000):

- cost of highway freight per ton-mile,
- cargo insurance rates,
- point-to-point travel times on selected freight-significant highways,
- hours of delay per 1,000 vehicle miles on selected freight-significant highways,
- crossing times at international borders,
- condition of connectors between NHS and intermodal terminals, and
- customer satisfaction.

Along with a number of transportation agencies in the western U.S., FHWA was a co-sponsor of the Western Transportation Trade Network study, one of the purposes of which was to evaluate how major freight transportation corridors were performing in the 17 states covered by the study. This including developing a set of minimum tolerable

conditions for roads and bridges, and using the Highway Performance Monitoring System to identify deficiencies for each of the transportation corridors (Wilbur Smith Associates and Felsburg Holt & Ullevig 1999).

Beginning in the late 1980s and early 1990s, Oregon was a leader in the development of benchmarks to track achievement of the state's goals for quality jobs, caring and engaged communities, and healthy sustainable communities. The Oregon Progress Board continues to track and monitor achievement of the "Oregon Shines" vision first documented in 1989 and most recently in 1999. Benchmarks adopted for the 2001-2003 biennium include several related to transportation in general but none specifically for freight.

Similarly, ODOT was a leader among state transportation agencies in the development of performance measures (Wipper 1993). Performance measure development at ODOT continues to evolve, including more recently, the development of three high level goals and 18 associated outcomes (Oregon Department of Transportation 2000). Several of these outcomes pertain directly or indirectly to freight or goods movement, for example,

- reduce travel times and delays between communities in key freight corridors,
- improve system operation from the user perspective (highways, rail, transit and other modes),
- improve choices of travel and shipping alternatives, and
- increase reliability of intermodal transfers in a seamless system.

ODOT currently is considering the development of specific outcome, output, efficiency, and/or explanatory measures for each of the high-level outcomes.

Oregon's Intermodal Management System. Part of the work effort associated with developing Oregon's Intermodal Management System in the mid-1990s included the identification of performance measures for intermodal connectors and facilities. After reviewing the literature and interviewing intermodal stakeholders, a consultant team, working with the Port of Portland, Metro (Portland-area MPO), and ODOT, identified five categories of measures: accessibility, capacity, connectivity, safety, and time delay (CH2M Hill et al. 1997). For each of these categories, the consultant team proposed a variety of measures.

Regarding connector roads and highways, for example, the consultant team proposed measures in capacity, safety, and time delay categories (Table 3). Specific measures were developed relating to congestion (e.g., volume-to-capacity ratios), condition of the facility (e.g., pavement condition), safety (e.g., accident rates), and time delay (e.g., annual hours of truck delay).

The consultant team also proposed measures for terminals where freight is exchanged between modes. Examples include annual throughput as a percentage of capacity throughput, number of hours daily when service is available, and number of hours waiting in line outside the terminal gate.

Table 3

Proposed IMS Performance Measures for Connector Roads and Main Roadway Routes

Capacity	Safety	Time Delay
Average weekday PM peak hour volume-to-capacity ratio	% of statewide average, annual fatality accident rate for ODOT functional class	Annual truck hours of delay
Intersection average weekday PM peak hour entering volume-to-capacity ratio	% of statewide average, annual injury accident rate for ODOT functional class	Annual truck hours of delay from incidents
Pavement with legal load limitation (Yes/No)	% of statewide average, annual property damage accident rate for ODOT functional class	Presence of an at-grade railroad crossing (Yes/No)
Pavement condition rating	% of statewide average, annual fatality accident rate for intersections for ODOT functional class	Presence of a movable span bridge (Yes/No)
Bridge with posted load limitation	% of statewide average, annual injury accident rate for intersections for ODOT functional class	Suboptimally timed signal progression (Yes/No)
	% of statewide average, annual property damage accident rate for intersections for ODOT functional class	Suboptimal intersection geometrics

For each performance measure, the consultant team established a quantitative or qualitative threshold value. If the performance measure value does not meet the threshold value, then a need may exist and further investigation is required to more fully scope the situation. An example of a quantitative threshold value is a weekday peak-hour volume/capacity ratio of 0.80 for roadway segments. If the observed value for a roadway segment exceeds this value, then a need may exist. An example of a qualitative threshold value is "yes" for pavement with a legal load limitation. If "yes," then a need may exist to upgrade the pavement for the roadway segment with the limitation.

Oregon Highway Plan. The 1999 *Oregon Highway Plan* establishes several performance measures for freight moving on highways. For the Highway Plan policy addressing the State Highway Freight System, the measures are:

- number and percentage of accidents on the designated State Highway Freight System involving trucks, and
- percentage of freight system lane miles that meet highway mobility standards during peak hour or two-hour peak period.

For the Highway Plan policy addressing travel alternatives, the freight-related measures are:

- percentage of identified obstacles to freight movement that are eliminated through action of the State, or the State in partnership with others, and
- percentage (or number) of intermodal connectors improved.

The Highway Plan does not set performance standards or thresholds for freight system accident numbers or rates, obstacles, or connectors improved. This suggests that base-year numbers or rates will be established for purposes of tracking and comparison.

State Highway Freight System Volume/Capacity Standards

Outside the Portland Area	
• Rural	0.70
• Urban	0.70 to 0.85
Portland Area	0.90 to 0.95

The plan, however, does set mobility standards, which are based on volume-to-capacity ratios. If the v/c ratio for a highway segment exceeds the v/c ratio established in the plan, then the highway segment does not meet ODOT's minimum operating conditions. Acceptable v/c ratios are higher for built-up urban areas than for rural areas, which means that relatively greater congestion is acceptable in urban areas than in rural areas. Acceptable v/c ratios also are five percent higher for non-freight highways than for freight routes, which means that relatively greater congestion is acceptable on non-freight highways than on freight routes. The maximum acceptable v/c ratio for freight routes ranges from 0.70 to 0.95 depending on location.

The Highway Plan also discusses target levels for pavement and bridge conditions. For pavements, ODOT has established a target of 90 percent of Oregon's highway mileage having a pavement condition of fair or better. The Highway Plan maintains this standard while acknowledging insufficient funding may mean that less than 90 percent of the mileage will be fair or better for less heavily traveled highways. The Highway Plan gives priority to investing in thicker pavement on designated freight routes than other types of highways.

For the Highway Plan, ODOT developed a Bridge Value Index based on a percentage of total replacement value statewide. The Highway Plan does not develop a threshold score to indicate when a specific bridge does not meet a minimum standard or set of standards.

The Highway Plan also includes the estimation of various types of highway needs over the 20-year period from 1998 to 2017. Estimation of "feasible needs" is based on a variety of standards set for Highway Economic Requirements System modeling and other procedures. For example, for pavement preservation, needs are based on the cost of getting 90 percent of state highway mileage to fair or better pavement condition by 2010 and keeping it at 90 percent to the year 2017.

Information from the Highway Plan estimation of needs was used in the Freight Moves study to develop an estimate of needs for the State Highway Freight System. Freight system needs generally were based on the same procedures used for highways statewide.

Oregon Commercial Vehicle Safety Plan. ODOT's Motor Carrier Transportation Division has identified a number of initiatives to reduce highway crashes involving trucks. Many of these initiatives are described in the *Commercial Vehicle Safety Plan* prepared for the Motor Carrier Safety Assistance Program.

The Safety Plan identifies a number of strategies, activities, and performance measures to meet program objectives. In general, the objectives pertain to reducing truck crashes statewide and in high accident locations. The 1999 Plan focuses on reducing 1) crashes due to sleepy or fatigued truck drivers statewide, 2) crashes in 12 corridors with high numbers of truck at-fault crashes, and 3) the percentage of intrastate motor carriers which are put out of service due to mechanical violations.

Performance measures for these three objectives are stated in terms of a target to be achieved as follows:

- reduce sleep/fatigue-related truck crashes by 30 percent within a three-year period,
- reduce truck crashes related to speed, following too closely, unsafe lane change, and unsafe turns by 30 percent within a three year period in the 12 high-truck-crash corridors, and
- decrease mechanical out-of-service percentage for intrastate carriers by 30 percent within a three-year period.

The Safety Plan also includes a number of more detailed performance measures associated with various strategies and activities for these three major program areas.

Other. The *Oregon Transportation Plan* sets a minimum level-of-service target of 25 miles per hour for rail freight operating speed. This corresponds to the maximum speed allowed for Track Class 2. ODOT's Rail Division estimates that about 12 percent of Oregon's rail mileage is in Track Class 1 as defined by the Federal Railroad Administration. Most of this trackage is on short-line railroads.

The *Oregon Transportation Plan* establishes general minimum levels of service for intermodal facilities, including marine terminals and connector roads, but does not develop specific performance measures. Likewise, the Oregon Economic and Community Development Department, which is statutorily charged with coordinating marine freight activities at the state level, has not established specific performance measures. Recent proposals to develop performance standards for salmon recovery efforts may affect performance of Oregon's marine terminals along the Columbia and Willamette Rivers and the Oregon coast. If target recovery levels for salmon recovery are not reached, the breaching of Snake River and other dams may be more likely to occur. This would affect transportation movements and performance in much of the

interior Pacific Northwest, especially roads in crop production areas east of the Cascade Mountains.

The *Oregon Aviation Plan* sets minimum acceptable facility standards for terminal facilities at different types of airports, including commercial airports and high activity general airports. These apply generally to ramp space, surface access, and vehicle parking. The plan does not identify specific numerical values for these measures.

The *Oregon Transportation Plan* establishes a minimum level of service for natural gas availability, but does not establish performance measures for petroleum pipelines. Recent concerns over pipeline safety may lead to the establishment of state-level standards.

Discussion

Over the last 10 years and especially in the last five, substantial progress has been made toward better integrating freight considerations into transportation policy, planning, and programming in Oregon. Successes have included raising awareness of the importance of freight to the state's economy, which in turn is reflected in a variety of policy, planning, and programming decisions. Challenges, however, remain. Among these are the following.

Maintaining private sector interest in policy and planning activities is a significant challenge. While several private sector representatives have long maintained interest in such activities, the "pool" of people so interested and involved is relatively small. This no doubt occurs in part because of inherent differences between the ways the private sector and public sector make decisions about needs and investments; e.g., the private-sector time frame tends to be much shorter than the public sector's time frame. Private-sector representatives often lose interest in public sector activities that are not well focused, have "squishy" products or results, or take too long to complete.

Using performance measures to identify transportation improvements can be an example of a public sector activity in which private sector participants lose interest over time. Performance measures that sound good conceptually often are problematic to implement because the data needed for measures are not available, are available but difficult or expensive to obtain, or are not reported regularly enough to be useful. Muddling through efforts to develop and implement performance measures can be intensely arduous for public sector staff, and even more so for private sector representatives trying to help through service on advisory committees. Keeping the effort simple is excellent advice but not always easy to follow. ODOT continues to seek the proper balance between meaningful and easy-to-measure performance standards and criteria.

Currently, much of ODOT's freight planning activities are directed toward implementing various next steps as illustrated in Table 2 earlier in this report. Examples include:

- updating statewide modal plans and implementing freight policies and actions in existing plans,
- developing guidelines for planners and consultants to use when developing freight elements for local and regional transportation system plans,
- working with MPO and ODOT corridor planners on regional freight transportation planning activities,
- participating in efforts to develop better commodity flow information,
- supporting completion of a statewide shipper and motor carrier survey,
- providing staff support for the Oregon Freight Advisory Committee,
- refining measures and criteria to help evaluate freight transportation improvement needs,
- preparing maps, tables, and other materials to help STIP coordinators and others understand freight movement concerns and needs,
- developing stories and other materials to communicate freight information inside and outside ODOT, and
- maintaining ODOT's recently developed intermodal-freight web site at http://www.odot.state.or.us/intermodal-freight/.

Implementation of these and not-yet-identified next steps in part will occur in conjunction with activities of the Oregon Freight Advisory Committee. Over the longer term, the next steps and how they are implemented likely will be critical factors in evaluating the success of ODOT's freight transportation planning.

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